

**SUPERFUND RESPONSE ACTION PRIORITY PANEL REVIEW FORM****Date Form Completed:** January 30, 2013**General Site Information**

Region: Region 3 City: Doylestown State: PA

CERCLIS EPA ID: PAD002323848 CERCLIS Site Name: Chem-Fab

NPL Status: (P/F/D) Final Year Listed to NPL: 2008

**Brief Site Description:** *(Site Type, Current and Future Land Use, General Site Contaminant and Media Info, Site Area and Location information.)*

The Chem-Fab Superfund Site is located in Doylestown Borough, Bucks County, Pennsylvania. The Site includes the commercial property located at 300-360 N. Broad Street upon which industrial and disposal operations occurred in the past as well as other properties on which contamination from such operations has migrated. The Property currently contains a small office park located in three buildings which host several commercial tenants. The Site is located approximately 0.6 miles from the center of Doylestown and is surrounded by a mixture of commercial, industrial and residential areas. The closest school is approximately 0.5 miles to the southwest. Future land use is anticipated to be consistent with the current land use.

Surface water generally drains from the Property toward Cooks Run to the west of the Property. There is also a drainage swale on the adjacent self-storage facility, which directs surface run-off south and then west to Cooks Run. Contamination has been detected in the drainage swale, and is likely discharging into the swale from contaminated soils at the Property. Cooks Run is a tributary of Neshaminy Creek, which eventually discharges into the Delaware River. The forested area to the west of Cooks Run includes scattered forested wetlands.

The aquifer at the Site is designated by Pennsylvania as a drinking water aquifer. Residents in the Chem-Fab Site area are on public water supply. The Borough of Doylestown provides public water supply to the general area. Two municipal supply wells have been affected by contamination from the Site. Doylestown Municipal Water Authority Well #13 is located within 0.25 miles of the Property and was shut down in 2001 to help prevent further spread of the contamination. Site-related contamination has also been discovered in Doylestown Municipal Water Authority Well #8, which is located approximately 0.5 miles to the southwest of the Property and continues to be monitored for contamination. Well #8 is still in active use as a water supply for the Doylestown community. Future groundwater use is anticipated to be consistent with current groundwater use.

From the mid-1960s to the early 1990s, Chem-Fab, Inc. operated an electroplating and metal etching facility on the Property that generated wastes that included metals, volatile organic compounds ("VOCs") and other industrial wastes. The Chem-Fab facility was cited several times during the 1960s and 1970s for spills and improper discharge of industrial wastes from above-ground storage tanks, underground storage tanks, and a catch basin to Cooks Run, a nearby creek. These releases included chromic acid rinse water spills from broken valves on pretreatment tanks and overflows of the catch basin. In the 1970s, liquid wastes, including hundreds of thousands of gallons of ammonia, hydrochloric acid, and pickle liquor waste were transported from various industrial entities to the Property for disposal.

In 1987, EPA collected water samples from residential wells and municipal wells located in the vicinity of the Chem-Fab Site as part of a PA/SI. The samples were found to contain elevated levels of VOCs including TCE and PCE. As a result, EPA conducted a removal action which included the delivery of bottled water and carbon filtration units to affected residences and ultimately, the connection of affected residences to public water supplies.



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In 1999, PADEP began an investigation of the soils and groundwater in the vicinity of the Site. PADEP found hexavalent chromium ("Cr[VI]") and VOCs in the soils and in the groundwater on the Property and on an adjacent property. The area of highest soil contamination roughly corresponds to the area where the above-ground tank farm was previously located. The former Chem-Fab facility had up to six above-ground storage tanks as well as a 10,000 gallon underground storage tank.

Groundwater at the Site contains many of the constituents found in soil at the Property including, among other contaminants, Cr[VI], PCE, TCE, and chemicals associated with the degradation of PCE and TCE. The groundwater contamination extends from the Property in a southwest direction beneath the adjacent self-storage facility and into neighboring commercial and residential properties. The groundwater contamination also flows slightly westward in the dip direction towards Cooks Run.

Vapor intrusion sampling has been conducted by both PADEP and EPA at the buildings on the Property, at the adjacent commercial property to the east, the adjacent self-storage facility, the wastewater treatment facility, and the residential development and elementary school to the southwest of the Site. VOC contamination was detected in the buildings on the Property at levels exceeding EPA's threshold criteria for a removal action. The Removal program is currently utilizing a vapor mitigation system and carbon filters on the HVAC system to address the VI issue.

**General Project Information**

Type of Action:	Remedial	Site Charging SSID:	03DR
Operable Unit:	01	CERCLIS Action RAT Code:	
Is this the final action for the site that will result in a site construction completion?			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Will implementation of this action result in the Environmental Indicator for Human Exposure being brought under control?			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**Response Action Summary**

Describe briefly site activities conducted in the past or currently underway:

In 1987, EPA collected water samples from residential wells and the municipal well located in the vicinity of the Chem-Fab Site as part of a PA/SI. The samples were found to contain elevated levels of VOCs including TCE and PCE. As a result, EPA conducted a removal action which included the delivery of bottled water and carbon filtration units to affected residences and ultimately, the connection of affected residences to public water supplies.

In 1994-1995, EPA conducted a removal assessment, followed by a second removal action at the Chem-Fab Site. During that response, EPA removed 117 drums and 8,400 gallons of liquid wastes, including chromium-contaminated wastes from the UST as well as other solid wastes and fuel oils. During the response action, EPA found label information on drums and other containers indicating the presence of xylene, toluene, hydrochloric acid, sulfuric acid, nitric acid, caustic soda, methyl isobutyl ketone, polymeric isocyanate, benzenesulfonic acid, nickel rinse waste, methylene chloride, ferric chloride, chromate waste acid, and anhydrous ammonia.

From 1999 to 2008, PADEP conducted an investigation of the soils and groundwater in the vicinity of the Site. PADEP found hexavalent chromium and VOCs in the soils and in the groundwater on the Property and on nearby properties.



In September 2009, EPA initiated a fund-lead Remedial Investigation and Feasibility Study at the Chem-Fab Site. The Remedial Investigation has thus far included additional soil, sediment, and groundwater testing to supplement previous investigations conducted by PADEP.

Vapor intrusion sampling has been conducted by both PADEP and EPA at the buildings on the Property, at the adjacent commercial property to the east, the adjacent self-storage facility, the wastewater treatment facility, and the residential development and elementary school to the southwest of the Site. VOC contamination was detected in the buildings on the Property. The Removal program is currently utilizing a vapor mitigation system and carbon filters on the HVAC system to address the VI issue.

**Specifically identify the discrete activities and site areas to be considered by this panel evaluation:**

The interim remedy for Operable Unit 1 will specifically address soils located on the Property outside the footprint of the buildings on the Property. The intent of this interim remedial action is to address the most highly contaminated soils at the Site. These soils present a continued source of contamination to groundwater as well as a potential threat from direct contact to contaminated soils. This interim action will not address contaminated soils on the Property beneath the buildings on the Property, soils located outside the Property boundaries, or contaminated groundwater.

All soils outside the footprint of the buildings at the Property contaminated at levels that present an unacceptable risk from direct contact or ingestion of contaminated groundwater (estimated at approximately 3,600 cubic yards) would be excavated and disposed of off-Site. Soil exceeding RCRA Toxicity Characteristic Leaching Procedure criteria would be sent to a RCRA Subtitle C facility for treatment and disposal in accordance with the RCRA Land Disposal Restriction standards. Soil determined not to be hazardous waste would be disposed at a RCRA subtitle D facility. Excavated areas would be backfilled with clean material.

Implementation of this remedy would include steps necessary to permit continued use of the Property by the commercial tenants and their patrons. Dust suppression techniques would be used to minimize exposure to airborne contaminants during excavation. Air monitoring would be performed to ensure the effectiveness of these techniques. Walkways would be built to allow safe ingress and egress from parking areas to the tenant spaces. The excavation would occur in stages to enable continued use of some of the existing parking areas. The buildings would be shored and stabilized where necessary during the project. Parking surfaces would be reinstalled following completion of the soil removal.

**Briefly describe additional work remaining at the site for construction completion after completion of discrete activities being ranked:**

EPA will complete the RI/FS for the Site under OU2. At the conclusion of the RI/FS a Final ROD will be written to address remaining contaminated media at the Site, including soils not addressed in OU1, groundwater, sediments, and surface water.

### **Response Action Cost**

**Total Cost of Proposed Response Action:**

*(\$ amount should represent total funding need for new RA funding from national allowance above and beyond those funds anticipated to be utilized through special accounts or State Superfund Contracts.)*

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Soil Excavation and Off-Site Disposal

Construction Cost Estimate: \$1,609,400

Management, Permitting, and Site Services (15%): \$241,400

Contingency (25%): \$402,400

Total Cost : \$2,253,200

SSC Funding (10%):\$225,300

Grand Total : \$2,027,900

Source of Proposed Response Action Cost Amount:

*(ROD, 30%, 60%, 90% RD, Contract Bid, USACE estimate, etc...)*

ROD

Breakout of Total Action Cost Planned Annual Need by Fiscal Year:

*(If the estimated cost of the response action exceeds \$10 million, please provide multiple funding scenarios for fiscal year needs; general planned annual need scenario, maximum funding scenario, and minimum funding scenario.)*

FY 2013: \$2,027,900

Other information or assumptions associated with cost estimates?

**Readiness Criteria**

1. Date State Superfund Contract or State Cooperative Agreement will be signed (Month)?

A new model of the Superfund State Contract (SSC) is being negotiated with Pennsylvania. We expect to have assigned SSC by June 2013.

2. If Non-Time Critical, is State cost sharing (provide details)?

Not Applicable.

3. If Remedial Action, when will Remedial Design be 95% complete?

Remedial Design will be 95% complete June 2013.

4. When will Region be able to obligate money to the site?

July 2013

5. Estimate when on-site construction activities will begin:

August 2013

6. Has CERCLIS been updated to consistently reflect project cost/readiness information?



Yes.

**Site/Project Name:** Chem Fab Superfund Site

**Criteria #1 - RISKS TO HUMAN POPULATION EXPOSED (Weight Factor = 5)**

Describe the exposure scenario(s) driving the risk and remedy. Include risk and exposure information on current/future use, on-site/off-site, media, exposure route, and receptors:

Since the RI has not been completed for the Site, a Baseline Human Health Risk Assessment ("RA") was not prepared for this operable unit. Instead, a more limited risk evaluation was performed. Additional risk calculations were performed during the development of the remedial goals to ensure EPA's acceptable risk range was not exceeded.

As the scope of this interim action was limited to soils on the Property outside the footprint of the buildings, EPA considered the following exposure scenarios related to this media: Future potential exposure to a residential (adult/child) receptor via direct contact to soils and to groundwater contaminated by soils. EPA has concluded that both exposure scenarios would result in a non-cancer hazard that exceeds the target threshold of 1 and a cancer probability that exceeds the upper bound of the cancer risk management range ( $10^{-4}$ ). Hexavalent Chromium, TCE, and PCE were identified as risk drivers for the estimate of non-cancer hazard and/or cancer risk. The primary target organs for the risk drivers, excluding risk drivers at background levels, are liver, kidney and developmental endpoints.

Current and future exposure to vapor intrusion risks for commercial workers was assessed by the removal program after the ROD was signed. EPA concluded that the concentrations present in both the indoor air and subslab would result in a non-cancer hazard that exceeds the target threshold of 1 and a cancer probability that exceeds the upper bound of the cancer risk management range ( $10^{-4}$ ). A non-cancer hazard quotient of 790 and a cancer risk estimate of  $2.3 \times 10^{-3}$  were estimated based on subslab sample results.

Estimate the number of people reasonably anticipated to be exposed in the absence of any future EPA action for each medium for the following time frames:

<b>MEDIUM</b>	<b>&lt;2yrs</b>	<b>&lt;10yrs</b>	<b>&gt;10yrs</b>
Surface Soil	100	100	100
Groundwater	300	8700	8700

Discuss the likelihood that the above exposures will occur:

Overburden soil on the property is the main driver of potential exposure. The commercial buildings on the Property contain ten active businesses. There is also a large commercial business adjacent to the Property to the east and a self-storage facility to the west, which contains an office and an apartment. Therefore, vapor intrusion presents a significant threat currently. EPA concluded that the concentrations present in both the indoor air and subslab of a building on the Property would result in a non-cancer hazard that exceeds the target threshold of 1 and a cancer probability that exceeds the upper bound of the cancer risk management range ( $10^{-4}$ ). Absent EPA action, it is anticipated that these risks would persist into the future. Redevelopment of the property could lead to additional exposures to workers and the public.



Previous investigations have confirmed that bedrock groundwater at the Site is contaminated with chlorinated solvents including PCE, TCE, and breakdown products. The contaminant plume emanates from the Property and has migrated in the general direction of groundwater flow to the west and southwest, toward a neighborhood to the west, and also toward a larger housing development and elementary school to the southwest. Exposure to residents in the short-term to the contaminant plume could occur via vapor intrusion.

VOCs were detected within residential and commercial wells to the west of the Property. The affected homes and businesses were placed on public water supply as a result of an EPA Removal Action. VOCs have also been detected in two Doylestown Borough water supply well located downgradient from the Site. Borough supply well #13 was taken off-line due to contamination. Borough supply well #8 is still in operation and supplies water for the population of Doylestown. Borough supply well #8 does not have treatment for VOCs or hexavalent chromium. If this well continues to pull the plume to the southwest, the contamination in this well is anticipated to increase, resulting in additional exposures. Doyle elementary school is adjacent to borough supply well #8. Continued pumping of the contaminate plume towards this area would create risks not only from direct exposure to contaminated drinking water, but also via vapor intrusion. A residential neighborhood in the adjacent Doylestown Township could also be affected from vapor intrusion as the plume expands.

Other Risk/Exposure Information?

**Site/Project Name:** Chem Fab Superfund Site

**Criteria #2 – SITE/CONTAMINANT STABILITY (Weight Factor = 5)**

Describe the means/likelihood that contamination could impact other areas/media given current containment:

Soil investigations at the Property have shown contamination throughout the overburden, from just underneath the surface to the top of bedrock. Similar contaminants in high concentrations have been found in the groundwater just below the source area, indicating that contamination is actively moving from the soil to groundwater. Contaminants can migrate from the soil to groundwater via two mechanisms; infiltration of surface water from precipitation can carry contaminants downward, fluctuations in the water table can also carry contaminants downward.

The groundwater is not contained. There is evidence that the plume is being drawn towards the west/southwest due to the historical pumping of supply well #13 and current pumping of supply well #8. Supply well #8 continues to pump pulling contamination in the plume both laterally toward the southwest as well as vertically downward.

The presence of contamination in indoor air and subslab samples indicates that vapor intrusion is occurring. Vapors from the source area can move both vertically and laterally to enter the commercial building.

Are the contaminants contained in engineered structure(s) that currently prevents migration of contaminants? Is this structure sound and likely to maintain its integrity?

Approximately half of the area under consideration of the ROD is covered by asphalt or concrete. The remaining half is covered by a gravel parking lot. The asphalt provides a barrier to infiltration from precipitation. However, the site owner has recently made several cuts into the parking lot, compromising the protection that the asphalt provided. The gravel parking lot does not provide any protection from infiltration.



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No part of the Property is protected from groundwater fluctuations carrying contamination downward.

There is not a vapor barrier present to prevent vapors from entering the building. The building is built on a slab. However, indoor air sample results indicate that the slab is not adequate to prevent vapors from entering the building.

Are the contaminants in a physical form that limits the potential to migrate from the site? Is this physical condition reversible or permanent?

The major contaminants are hexavalent chromium, TCE, PCE and associated breakdown products. Hexavalent chromium is highly soluble and has spread from the property via groundwater movement. The VOCs are also soluble and migrated with groundwater as well. The concentrations of VOCs suggest that there is a NAPL source present at the Site.

Are there institutional physical controls that currently prevent exposure to contamination? How reliable is it estimated to be?

There are no institutional controls currently in place.

Other information on site/contaminant stability?

**Site/Project Name:** Chem Fab Superfund Site

**Criteria #3 – CONTAMINANT CHARACTERISTICS (Weight Factor = 3)**

*(Concentration, toxicity, and volume or area contaminated above health based levels)*

List Principle Contaminants (Please provide average and high concentrations.):

*(Provide upper end concentration (e.g. 95% upper confidence level for the mean, as is used in a risk assessment, or maximum value [assuming it is not a true outlier], along with a measure of how values are distributed {e.g. standard deviation} or a central tendency values [e.g., average].)*

<b><u>Contaminant</u></b>	<b><u>*Media</u></b>	<b><u>**Concentrations</u></b>
Chromium (VI)	SL	781 mg/kg maximum concentration
TCE	SL	4000 mg/kg maximum concentration
PCE	SL	190 mg/kg maximum concentration

*(\*Media: only soil contaminants are considered for this Operable Unit)*

*(\*\*Concentrations: Risk assessment has yet to be performed. Therefore, only maximum concentrations provided.)*

Describe the characteristics of the contaminant with regards to its inherent toxicity and the significance of the concentrations and amount of the contaminant to site risk. *(Please include the clean up level of the contaminants discussed.)*

Short term high level exposure to hexavalent chromium can result in adverse effects at the point of contact, such as ulcers if the skin, respiratory problems, and irritation of the gastrointestinal tract. Hexavalent chromium is a known human carcinogen by the inhalation route of exposure. Exposure to TCE has been associated with deleterious health effects in humans, including anemia, skin rashes, diabetes, liver conditions and urinary tract disorders. TCE is carcinogenic to humans by all routes of exposure. Exposure to PCE has been associated with skin irritation, dizziness, nausea, and liver and kidney damage. PCE is likely to be carcinogenic in humans by



all routes of exposure.

Cr(VI), TCE, and PCE all contribute significantly to risk at the Site. While a risk assessment has not been performed, a cursory comparison of the maximum concentrations of these contaminants to the direct contact RSL (corresponding to  $10^{-6}$  cancer risk or a hazard index of 0.1) provides a relative indication of the risk associated with these contaminants at the Property. Cr(VI), max. conc.: 781 mg/kg, DC RSL: 0.29 mg/kg. TCE, max. conc.: 4000 mg/kg, DC RSL: 2.8 mg/kg. PCE, max. conc.: 190 mg/kg, DC RSL: 0.55 mg/kg.

Several other metals, VOCs, and semi-VOCs also contribute to risk either through the direct contact pathway or through their contribution to exposure to groundwater contaminated by the soil.

Because a risk assessment has not been performed, a tiered approach has been taken to determine cleanup levels. The cleanup levels listed below are based on the potential for contaminants in the soil to contaminate groundwater to levels which would exceed the respective MCL for the contaminant (MCL-SSRG). Only MCL-SSRGs for Cr(VI), TCE, and PCE are shown. In general, these cleanup standards are more conservative than standards for direct contact. Therefore, these standards are expected to address both the direct contact and soil to groundwater risks. Risks from the cumulative effect of multiple contaminants were addressed by taking an additional step of performing risk calculations at sampling locations which did not meet the MCL-based cleanup criteria.

**REMEDIAL CLEANUP LEVELS FOR OU1 SOIL**

<b>COCS</b>	<b>MAX. CONCENTRATIONS (mg/kg)</b>	<b>MCL-SSRG (mg/kg)</b>
Cr(VI)	781	101
TCE	4000	0.102
PCE	190	0.129

Describe any additional information on contaminant concentrations which could provide a better context for the distribution, amount, and/or extent of site contamination. *(e.g. frequency of detection/outlier concentrations, exposure point concentrations, maximum or average concentration values, etc.....)*

The highest concentrations of the COCs anywhere on the Chem Fab Site are found on the Property in areas associated with the tank farm and former underground storage tanks, which correspond to the areas the interim action seeks to address. The purpose of limiting the scope of the interim action is to address the source of contamination. Soil contamination exists outside the scope of this operable unit (i.e., underneath the buildings on the Property, outside the borders of the Property), but at lower levels and likely a result of transport by shallow groundwater.

Other information on contaminant characteristics?

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**Criteria #4 – THREAT TO SIGNIFICANT ENVIRONMENT (Weight Factor = 3)**

*(Endangered species or their critical habitats, sensitive environmental areas.)*

Describe any observed or predicted adverse impacts on ecological receptors including their ecological significance, the likelihood of impacts occurring, and the estimated size of impacted area:

The Chem Fab property is located in an area of mixed commercial, residential and industrial development. Surface water generally drains from the Property toward Cooks Run to the west of the Property. There is also a drainage swale on the adjacent self-storage facility, which directs surface run-off south and then west to Cooks Run. Cooks Run is a tributary of Neshaminy Creek, which eventually discharges into the Delaware River.

The forested area to the west of Cooks Run includes scattered forested wetlands. These include isolated pools as well as areas associated with periodic inundation from Cooks Run. There are also wetlands east of Cooks Run in the forest and open field area between the Property and Cooks Run. In addition to Cooks Run, surface water is also present in the form of two ponds south of the self-storage facility.

While a full ecological risk assessment has not been performed for the Site, sediment and surface water samples from the wetlands area to the west of the Property have been collected and the results have been compared to freshwater screening benchmarks developed by the Region 3 Biological Technical Assessment Group (BTAG). Cr (VI) and TCE were both found in surface water samples exceeding the freshwater screening benchmarks. The maximum concentration for Cr(VI) in surface water (3,700 ug/L) was two orders of magnitude higher than the screening benchmark (11 ug/L), and the maximum concentration of TCE in surface water (260 ug/L) was one order of magnitude higher than the screening benchmark (21 ug/L).

TCE and PCE were found at levels in sediment samples exceeding the screening benchmarks. Cr(VI) was also detected in sediment samples; however, there is no screening benchmark for this COC in sediment. In addition, the semi-volatile compounds fluoranthene and pyrene were also detected in sediments above screening benchmarks.

Would natural recovery occur if no action was taken?

☐ Yes

☒ No

If yes, estimate how long this would take.

Other information on threat to significant environment?

**Site/Project Name:**

**Chem Fab Superfund Site**

**Criteria #5 – PROGRAMMATIC CONSIDERATIONS (Weight Factor = 4)**

*(Innovative technologies, state/community acceptance, environmental justice, redevelopment, construction completion, economic redevelopment.)*

Describe the degree to which the community accepts the response action.



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There were no significant or fundamental changes to the proposed remedy as a result of public comments. The community has expressed support for the action, including local elected officials and members of the community advisory group (CAG).

Describe the degree to which the State accepts the response action.

The Pennsylvania Department of Environmental Protection concurred with the selected remedy in a letter dated October 25, 2012, which is part of the Administrative Record.

Describe other programmatic considerations, e.g.; natural resource damage claim pending, Brownfields site, use of innovative technology, construction completion, economic redevelopment, environmental justice, etc...

The selected remedy will address a significant portion of the contamination present at the Site by removing the source of contamination. In addition, addressing this source material will significantly reduce the contamination which would have migrated to groundwater, and represents a significant cost-savings over removing an equivalent amount of the contamination once it has already migrated into groundwater. The remedy will also relieve concerns the Doylestown community has over health concerns associated with vapor intrusion at the operating commercial businesses located on the Property.